# ULTRASONIC CHARACTERIZATION OF POLYMERIC CONTAINERS

## ABSTRACT

The present invention provides a system and method for detecting changes in the properties of a polymeric material. A frame is hand held against the outside surface of a curved polymeric test specimen, e.g., fluid tank. A transmitting probe attached to the frame emits critically refracted ultrasonic waves that travel longitudinally across the chord of said curved test specimen and are detected by at least one receiving probe attached to the frame. A data processing system measures the travel time of the ultrasonic waves from the transmitting probe to the receiving probe and compares this measured travel time to an expected travel time. Variations in material properties along the penetration path of the ultrasonic waves can be detected from deviation in the measure travel time of the waves from the expected control values. Measuring the temperature of the polymeric specimen allows adjustment of the measured travel time of the waves to account for temperature effects on the polymeric material. Information about the contents of the container is used to further adjust the travel time of the ultrasonic waves to account for mechanical stress effects on the polymeric container walls.